EDITORIALS.

Botany for Secondary Schools

IT HAS SEEMED to the GAZETTE that botanists should interest themselves in the various movements among teachers for the proper teaching of science in secondary schools. The problem as to the kind of botany to be taught is not yet settled, and we fear that the advice obtained from the universities has not shown a full knowledge of the necessities and the conditions. Botanists combined to scout at the old "analysis" as an utterly inadequate presentation of botany even as a young student should see it, and they did well. Such work is not merely partial, but misleading; an injustice to both pupil and subject. But has the proposed substitute proved any more beneficent in its results? Has the swing of the pendulum from analysis to morphology done for the schools what was hoped? The university laboratories were ready enough to show how morphology should be taught, to point out the types useful for study, to name the appliances needed, and even to write guides and text-books so that no one need go astray. But what has been the result of it all? The writer is free to acknowledge, from a careful inspection of much of the best work done in the best equipped secondary school laboratories, that the advice was a blunder. The reason is not far to seek. It does not lie in lack of preparation on the part of the teacher, for universities are annually sending into the schools teachers who are trained to do just this kind of work. It lies in the age of the pupils and the structure of the schools. Such work has not resulted in a clear elementary conception of botany, but in a clear conception of nothing. The pupil is taken away from any possible experience of his own in reference to plants, and is introduced to structures which he can fit to nothing. The time limits for laboratory work are so short even in the most liberal schedules that his observations cannot be related properly in his own mind, and hence become perfunctory and meaningless. He is hurried rapidly from type to type, obtains glimpses of things through the microscope, and if the teacher is university bred and young his instruction will take such a philosophical turn that the pupil is hopelessly befogged. It has

been forced upon us, against our will and preaching and former best judgment, that botanists must recommend something else.

WE BELIEVE that the botanical field for the secondary school is that of ecology, and that modern morphology should be left to the colleges and universities, where maturity, and time, and apparatus, and teachers, are all adequate. The preparatory student needs to come in contact with plants in their general relations, to learn to look upon them intelligently in the mass, before he begins the continuous study of minute structures. The introduction of pure morphology has removed him from contact with plants as living things inhabiting the world, a contact which the old "analysis" gave in a sentimental rather than scientific way. He can be introduced to plants as a whole, not to "flowers" merely; he can study their habits of life, their adaptations to various conditions; the societies which they form. Certain intimate structures must be studied to make relations and adaptations significant, and so the microscope cannot be banished, but it can be made an incidental piece of apparatus, rather than the necessary aperture through which every glimpse of botany must be obtained. With ecology as the main purpose, and a certain amount of physiology and morphology as necessary adjuncts, such an impression of plants in general can be made that the more formal university courses will be much more significant than they are. In our judgment such work in the secondary schools not only will show better results in the schools themselves, but will send better prepared students into our university laboratories.

The American Tropical Laboratory

IT IS A CAUSE for congratulation that American botanists seem to be much interested in the tropical laboratory suggested in an editorial of the November GAZETTE. An expression of interest, however, to be effective, must be followed by a definite plan vigorously prosecuted. In the present number we publish an open letter from Professor MacDougal, whose research work is peculiarly in need of development in a tropical environment. As Mr. MacDougal has already planned a visit to the American tropics, the GAZETTE proposes that he be appointed chairman of a committee on inspection, associating with himself such other botanists as he may be able to secure. It should be the work of such a committee not merely to examine suitable locations, but also to

learn the conditions under which a grant from the government could be obtained, the conditions and cost of living, in short, all those facts, botanical, financial, governmental, and hygienic, which must enter into any plan of action. It is further suggested that a report be made by this committee next summer to the various botanical organizations which meet in convention with the American Association. In the meantime the GAZETTE would be glad to hear from those institutions and individuals who are willing to cooperate in the establishment of such a laboratory.